

THE PRICING OF UNES
EX PARTE PRESENTATION OF
THE NATIONAL ASSOCIATION OF STATE
UTILITY CONSUMER ADVOCATES
(NASUCA)

WC DOCKET NO. 03-173

PRESENTED BY:
DAVID GABEL, PHD
PROFESSOR, QUEENS COLLEGE
MIT INTERNET AND TELECOMMUNICATIONS
CONVERGENCE CONSORTIUM
AND
ROBERT LOUBE, PHD
RHOADS & SINON, LLP

NASUCA

MARCH 18, 2004

Some Objectives of UNE Cost Studies

- Ensure that rates are sufficiently high to permit recovery of reasonably incurred costs;
- Induce the efficient use of scarce resources;
 - This implies that rates should neither be too high nor too low.
- Induce efficient facilities based competition;
- Establish a price floor;
 - That is, prevent price squeezes and predatory pricing.
- Establish reasonable rates;
 - The reasonableness of rates is judged with respect to the relationship between price and cost.
- Provide Consistency.
 - A lack of consistency can distort markets.

The Inductive Approach Methodology

Our discussion today focuses on the loop because it is the most important UNE in terms of affecting the evolution of the competitive landscape.

- The RBOCs propose that the cost of the loop be estimated using a replacement cost methodology.
- This methodology is already being used by at least one RBOC, SBC, for deriving its estimate of the cost of the loop.
 - “[W]eighted unit feeder [original emphasis] are developed by cable type by weighting the various cable costs for each gauge by the number of pairs that are *in service* [emphasis added] for those gauges. Second, weighted unit investments for all cable [original emphasis], including both feeder and distribution cables, are developed using a similar weighting process.”

SBC Loop Cost System Model Reference –Unbundled Loop, Attachment BB, p. 22.

The Inductive Approach Methodology

- SBC's methodology results in higher cost estimates than a current demand approach due to the fact that a company's embedded inventory reflects network additions made in response to incremental increases in the demand for network services.
- To illustrate this point, consider the following hypothetical involving the sizing of feeder cable.
 - Imagine that along an existing feeder cable route SBC has installed three cables. Initially it installed a 600 pair cable. Then, in order to satisfy incremental demand, SBC first adds a 200 pair cable followed by a 100 pair cable. SBC's loop model would assume that a 300 pair cable, the average size of the three cables, would serve a customer along this feeder route.
 - A forward-looking, cost minimizing modeling methodology would look at the total network demand and then cost out the feeder cable required to meet that total demand. This approach would result in lower forward-looking cost estimates per loop owing to the fact that a least cost approach for sizing this network could involve laying one 900 pair cable vs. laying one 300 pair cable, as is the case using SBC's methodology. The per loop cost of a 900 pair cable is lower than the per loop cost of a 300 pair cable.

The Inductive Approach Methodology

- A higher cost estimate is not necessarily the right or wrong cost estimate.
 - We return to the costing of feeder plant after discussing distribution cables and serving area interfaces.
- For at least three decades distribution plant has been designed to satisfy ultimate demand.
 - Therefore the sizing of cables should largely be independent of the selected methodology, current demand or replacement.
- There will be a considerable difference in the cost estimates because the replacement methodology, unlike the current demand methodology, uses a constant cost per pair.
 - The cost per pair is based on the historical inventory of cables.

The Inductive Approach Methodology

- Using the average cost per pair derived from the embedded stock of cables results in an overstatement of costs in dense markets and an understatement of costs in rural areas.
- Using the average cost per pair debases the value of obtaining accurate customer location data because it limits the application of this data to determining cable lengths while ignoring the size of the cables installed.
 - This deficiency could be rectified by having the loop model select appropriately sized cables for each serving area and then applying the proper cost for the chosen cable size. But, this is exactly what is done in a current demand model!
 - Rather than having the model select the cable sizes, the ILEC could conceivably provide an inventory of the cable sizes used in each serving area. Such an undertaking would be expensive. Furthermore, since plant is designed to satisfy ultimate demand, this approach would likely provide information that is very similar to what emerges from having the model choose the correct size cable in the first place.

The Inductive Approach Methodology

What about the feeder-distribution interface (FDI) and serving area interface (SAI)?

- Under the replacement cost methodology the existing locations are incorporated into the model.
 - In order to use the current FDI/SAI locations in tandem with geo-coded customer locations. A large database must be constructed which ties every customer location to the appropriate interface.
 - This geo-coding will have to be done using ILEC records, rather than commercial data sources, because this information is not available from third-party sources.
- The motivation for using the current FDI/SAI locations is to have the model reflect the current layout of the ILECs' networks
 - However, it would be less expensive to achieve this objective by requiring that the loop estimates be reflective of the existing loop lengths.
 - This objective was adopted by the FCC in the Universal Service cost proceeding when the commission concluded that the loop lengths generated by the cost models be consistent with the ILEC's actual loop lengths.
- CC Docket No. 96-45, released. May 8, 1997 Paragraph 250.
- Alternatively, with the current demand approach, the optimal number and location of the FDIs and SAs are chosen by the model.

The Inductive Approach Methodology

- Paradoxically, at least one RBOC that relies on the replacement cost methodology for determining the cost of cables, contends that it is inappropriate to use today's network characteristics to determine the size of DLC equipment installed at the FDI.
 - In a UNE proceeding, SBC was asked to "Provide...data for DLC systems (showing the distribution of DLC systems installed)." SBC responded that; "Because this is a forward looking study, it relies on Engineering SMEs to choose the correct size of DLC for each zone and therefore does not need to rely on existing DLC in-place information. Existing DLC data was not used in the Loop study."
- This example illustrates how an RBOC may selectively switch between the current demand and replacement cost methodologies.

SBC Response to OCC-25, Connecticut Department of Public Utilities, Docket No. 00-01-02.

The Inductive Approach Methodology

Feeder issues.

- Verizon claims that prospectively they intend to only install fiber feeder.

- Verizon argued in a Maine UNE proceeding that the economic efficiency of optical DLC has reached a point where all feeder capacity can be most efficiently created using these systems.
- AT&T argued that Verizon's configuration did not comply with the FCC's TELRIC requirement that Verizon assume the least cost, most efficient, and reasonable technology in building its cost study.

Examiner's Report, 97-505, Dated 1/18/02.

The Inductive Approach Methodology

Feeder issues.

- We do not doubt that prospectively incumbents, like entrants, will install almost exclusively fiber feeder cables.
 - Should the cost model be based on what will occur in the (distant ?) future, an all fiber feeder network, or what will be used during the time in which the rates are in-place?
 - The replacement methodology supports using the latter approach while the current demand methodology supports either approach. The approach used depends on the objective of the cost study: is it to reflect cost-minimization or how a new network would be built today?
 - The network design of CLECs suggest that an all fiber feeder network would be used based on a current demand.
 - We are unaware of any CLECs that are installing copper feeder cables.

The Inductive Approach Methodology

Feeder issues.

- An all fiber feeder network should be incorporated into the model if the cost model is designed to reflect how networks will be constructed prospectively.
 - Concurrently, there is no reason to remain with the existing SAI/FDI locations since they were largely established to comport with the designs of a copper feeder network.
- Capacity additions for an all fiber feeder network are typically done through a change-out of electronics rather than the installation of new cables.
 - Therefore the conclusion that an all fiber-feeder network should be incorporated into the model supports the use of the current demand methodology.

The Inductive Approach Methodology

Feeder issues.

- Some models select copper or feeder based on whichever technology is cheaper.
 - Such an approach results in the selection of copper on short loops. The recommendation to use fiber rather than copper on short loops is driven by using as a costing objective profit maximization rather than cost minimization and the desire to cost out a network that is consistent with the way networks are being built today.
- The FCC determined in the TRo that the ILECs are not required to unbundle the broadband capabilities of hybrid copper-fiber loops.
 - TRo par. 288-89.
 - In order to avoid cross-subsidization of broadband services by DS0 services, a cost allocation methodology must be established to insure that CLECs offering voice services through fiber feeder facilities do not subsidize the ILECs broadband products.

The Inductive Approach Methodology

Feeder issues.

- The cost allocation issue does not affect our recommendation to cost out an all fiber feeder network.
 - Section 254(k) requires that “that services included in the definition of universal service bear no more than a reasonable share of the joint and common costs of facilities used to provide those services.” Therefore the cost of a “stand-alone” copper feeder network, the alternative network configuration, is not relevant because it would establish a price ceiling and not result in the allocation of any joint and common costs to broadband services.

The Inductive Approach Methodology

Feeder issues.

- **The assumption of an all fiber network implies that no load coils would be installed.**
 - It has been argued that consistency requires that a DLEC not be charged for requesting the removal of load coils that impede the provision of data services since load coils wouldn't be deployed under the assumed fiber architecture.
 - We believe that this argument is lacking because a forward-looking copper feeder network would also exclude load coils. This has been the practice of the industry for two decades.
- **The resolution of the question regarding how the cost of removing load coils should be charged to DLECs is independent of the decision regarding modeling the feeder portion of the network.**

Conclusion Regarding Our Preferred Methodology

- We recommend that the current demand methodology be applied consistently to the costing of UNEs.
- The methodology is compatible with the objectives we identified at the outset of the presentation.
- Our ultimate recommendation is driven by our understanding of how telecommunications networks are designed and the importance that we place on economic efficiency and consistency.

ILEC Proposals

- Tardiff and Shelanski base cost estimates “on the ILEC’s actual out-of-pocket expenditures.”
Verizon Reply Comments, Attachment, Par. 20.
- The FCC explicitly rejected this approach in the Expanded Interconnection Proceeding where it decided to require rates to be no higher than one standard deviation of the average.
 - “model the ILEC’s existing mix of network facilities, technologies, and infrastructure using available information about the network and then adjust that network model to take account of changes that actually will occur in the incumbent’s network during the forward-looking planning period.” and;
 - “estimate the long-run incremental costs the incumbent will incur by determining the average unit-cost of the facilities mix the ILEC expects to add to the network over a reasonably long-run period going forward.”
Verizon Reply Comments, Attachment, Par. 20.

ILEC Proposals

(continued)

- With regards to estimating the cost of a replacement network, Shelanski notes that information on network characteristics such as facility mix and utilization are readily available.

Verizon Initial Comments, Shelanski Attachment, par. 22.

- Based on our experience this data is often not readily available.
- The ILEC methodology does not measure the costs that the ILEC will incur prospectively.
 - This is because an ILEC will not, or would not, replicate its own network because shifts in demand, competitive constraints, technologies, and input prices make some of the historical information irrelevant for an economic cost study.
 - Therefore, the ILEC methodology will not promote efficient entry!
- We concur that some historical network characteristics should be considered for the study.
 - For example, network utilization, mix of aerial, buried, and underground facilities, and loop distances.
 - These historical values could be adjusted for known changes or trends but otherwise would be treated as presumptively reasonable.

ILEC Proposals

(continued)

- By known trends or changes we have in mind, for example, taking into account the historical decline in the percentage of aerial facilities.
- As discussed above, historical network characteristics for cable sizes or the mix between fiber and copper should not be used in the study.
- Shelanski rightly recognize that the second proposal, unit costs derived from future investments, may exclude critical assets.

Verizon Initial Comments, Attachment, par. 34.

Source Of Incremental Cost Data

- The RBOCs have not identified the data source for future investments.
- While the RBOCs construction budgets are a natural source for information on future expenditures the industry has found on numerous occasions that it is nearly impossible to extract useful costing data from the construction budget.
 - For example, BellSouth explained at a costing conference in 1990 that “the construction budget is not produced in sufficient detail to distinguish the specific components comprising loop facilities from other facilities.”
NRRI, Marginal Cost Techniques for Telephone Services: Symposium Proceedings, 96-6, p. 67.

Construction Cost Data

- Construction costs are problematic because it is difficult to tie construction costs to network elements and services.
- On numerous occasions ILECs have tried to use the construction budget to estimate the cost of service and the effort turned out to be unproductive.
 - In the early 1980s AT&T fruitlessly expended a huge amount of resources in this area prior to divestiture.
 - Prior to the passage of the Act, New England Telephone (Verizon) submitted to the Maine PUC cost studies for switching and transport based on data obtained from its construction budget. The loop study estimated the costs that would be incurred if the loop plant was completely rebuilt. “The Company stated it did not use the budget forecast approach to determine loop costs because the construction budget did not sufficiently identify loop investment related solely to growth.”

Maine Public Service Commission, Docket 92-130, April 13, 1994.

NASUCA

MARCH 18, 2004

20

Construction Cost Data

(continued)

Additional problems associated with using construction budgets:

- **There is a lack of consistency.**
 - The Maine Commission noted the need for consistency in study methodology: “NET’s use of a costing method for loop plant that is different from its costing method used for switching and transport network functions produces cost study results that make any determination of the different cost/price relationships for different services very difficult.”
Maine Public Service Commission, Docket 92-130, April 13, 1994.
 - This issue is relevant in the TELRIC setting because of the need for a mark-up to cover common costs.
- **Construction budget estimates are difficult to audit.**
 - “[W]e have no way to determine whether the amount and timing of the additions identified in NET’s construction forecast are reasonable.”
Maine Public Service Commission, Docket 92-130, April 13, 1994.
 - “[W]e are reluctant to rely on the results of NET’s construction budget-driven analysis for switching costs, as well as for transport costs, due to the discrepancies between the numbers NET used in its cost study and those in the source document, the Construction Budget, which served as a basis for the study.”
Maine Public Service Commission, Docket 92-130, April 13, 1994.
- The ILECs do not identify any jurisdictions were these implementation issues have been satisfactorily resolved.

NASUCA

MARCH 18, 2004

21

Construction Cost Data

(continued)

Additional problems associated with using construction budgets:

- There is a focus on current expenditures
 - Many expenditures are sunk and therefore there are zero or non-zero current or short-run expenditures.
 - New England Telephone's 1992 retail cost study excluded the cost of land, building, poles, conduit, and corporate overheads. NET explained "that its current capacity for these items is sufficient to meet its expected growth in the long-run future" and therefore should be excluded from a study.

Maine Public Service Commission, Docket 92-130, April 13, 1994.

Construction Cost Data

(continued)

- An economic cost study should estimate the costs that will be incurred prospectively.

- A methodology that is based on recent expenditures for a limited area, and applies those cost estimates to an entire network, is problematic.
- For those areas in which no new capital expenditures are made, and where the network costs are sunk, the incremental capital cost is most likely zero.
- Rather than have a zero cost for most areas in its network, ILECs do one of two things. They either:
 - assume that the typical size facility recent addition is the same type of facility that would be added throughout its network. This assumption is of course contrary to fact because capacity is not being added in this fashion. For if it were, there would be no need to make the assumption.
 - Cost a network that is a blank slate. This methodology is often employed in an ILEC retail cost study and is consistent with the methodology used in the TELRIC studies.
- Tardiff and Shelanski also note that that current expenditures may not be reflective of the universe (e.g., heavily weighted to new developments). “Adjusting for such distortions might lead to the type of speculation that the incremental cost approach is intended to avoid.”
Verizon Initial Comments, Shelanski Attachment, par. 34.

Do the RBOCs undertake replacement cost studies for their retail services?

- The RBOCs submissions do not address the relationship between the costing of their retail and wholesale services.
 - The RBOCs incremental retail cost studies model the cost of using future, not embedded technologies.
 - “[I]f the existing network consists in part of fiber optic cable and in part of copper cable, the embedded [historical] cost reflects this mix of technology. However, if future changes in output will be made by placing and adjusting the capacity of fiber optic cable, incremental costs would correctly be based on the cost of fiber optic technology. In this manner, an incremental cost study anticipates how resources will be deployed in the future rather than how or when resources were acquired in the past.”
- Richard Emmerson, Statement on behalf of Bell Atlantic, Competitive Safeguards Proceeding Docket No. M-940587, Pennsylvania PUC, June 15, 1995, p.15.
- Emmerson added that “a properly constructed TSLRIC study” should “represent the current and future technologies used to provide the service rather than the cost of embedded (historical) resources, unless the embedded costs are good proxies for the future.”
- Id., p. 20.

Investment Incentives

- The ILECs rightly note that **if TELRIC prices are too low investment by both CLECs and ILECs will be impeded.**
 - The goal of setting prices that encourage efficient investment is unobjectionable.
- However, prices should not be set based on the optimal level of investment because:
 - The law states that prices should be based on cost;
 - There is too much uncertainty associated with setting the “right” price.
See: Gabel-Loube affidavit section 5.
- The ILECs do not address why it is appropriate for them to use assumptions in their retail cost studies that provide as low or lower cost estimates than TELRIC studies.
 - We have in mind assumptions dealing with such issues as utilization and optimal network layout.

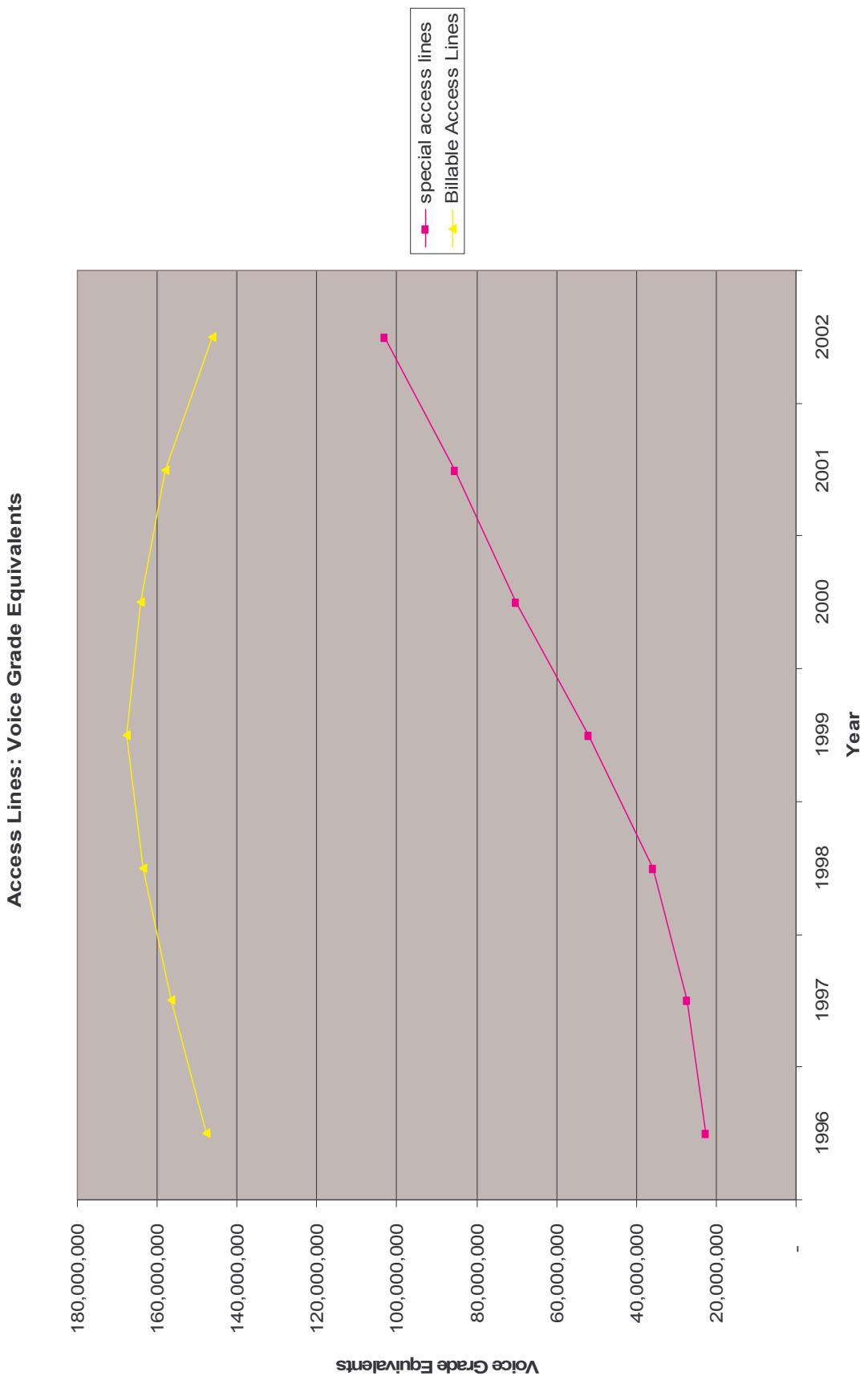
Investment Incentives

- The ILECs complain that “TELRIC is flawed because it is based on a hypothetical network that is built from scratch”
Verizon Reply, Shelanski and Tardiff, p.2.
- However, the ILECs never offer an example of how they properly estimated costs in their retail studies.
 - Examples are not provided because the methodologies are too similar.
- If wholesale rates are set higher than the retail cost floor due to a difference in methodology, a price squeeze can result.
- The FCC has a legal obligation to adopt rules and policies that prevent a price squeeze.

Sprint v. FCC, 2001 U.S. App. LEXIS 27292 (D.C. Cir. 2001); *FPC v. Conway Corp.*, 425 U.S. 271, 276-282 (1975); see also *NY, ME & H.R. Co. v. ICC*, 200 U.S. 361, 390-91 (1905).

Consistency In State UNE Rates

- The analysis of alleged rate inconsistency fails to control for the role of the FCC in setting UNE prices.
 - While the States did establish initial UNE prices, the rates were often modified in order to satisfy the Section 271 14-point check-list.
 - These adjustments were made within RBOC region by benchmarking results from one State, for example Colorado or New York, against rates in other states (e.g., the States of Washington or Massachusetts).
 - The FCC determined that it was inappropriate to benchmark rates between regions (e.g., the FCC determined that the loop rate for New York would not be used to test the reasonableness of the Washington rate).
- Whereas the FCC has concluded that it was inappropriate to compare States across regions we have seen no explanation by the FCC, or any party, explaining why this is now the proper methodology for judging the reasonableness of rates.



ARMIS 43-08 Special Access Lines

Year		2002	2001	2000	1999	1998	1997	1996
BellSouth Corporation	non-switched analog	295,227	333,934	294,669	154,715	101,650	59,651	74,524
Qwest Corporation	non-switched analog	33,617	44,617	244,775	178,433	158,961	173,103	57,103
SBC Communications	non-switched analog	375,135	321,519	333,094	332,164	512,579	531,038	999,640
Verizon Communications	non-switched analog	168,391	298,468	344,950	349,303	369,539	373,636	236,221
Sprint Local Telecommunications Divn.	non-switched analog	16,242	16,989	19,426	21,453	15,262	15,358	20,891
subtotal	non-switched analog	890,614	1,017,528	1,238,914	1,038,067	1,159,989	1,154,783	1,390,375
BellSouth Corporation	non-switched digital	18,834,817	15,749,513	12,668,132	7,140,625	4,616,038	2,900,340	2,711,216
Qwest Corporation	non-switched digital	7,199,844	6,917,828	6,033,796	8,019,832	6,337,347	5,416,877	4,042,025
SBC Communications	non-switched digital	40,732,923	31,270,567	26,762,833	21,549,756	14,452,719	11,272,434	9,698,458
Verizon Communications	non-switched digital	26,577,176	24,623,218	18,916,087	11,096,092	7,520,652	5,579,262	4,298,398
Sprint Local Telecommunications Divn.	non-switched digital	8,788,988	5,837,506	4,602,406	3,229,029	1,689,664	958,565	364,552
subtotal	non-switched digital	102,133,748	84,398,632	68,983,254	51,035,334	34,616,420	26,127,478	21,114,649
total	special access	103,024,362	85,416,160	70,222,168	52,073,401	35,776,409	27,282,261	22,505,024

ARMIS 43-08 Billable Access Lines

Company	2002	2001	2000	1999	1998	1997	1996
BellSouth Corporation	21,386,891	23,157,327	24,229,325	24,281,267	23,770,757	22,585,267	21,716,595
Qwest Corporation	15,682,208	16,664,145	17,626,160	17,448,690	16,859,395	16,132,694	15,164,709
SBC Communications	48,914,721	53,694,492	55,845,756	57,818,150	56,418,886	54,018,178	51,761,145
Verizon Communications	52,620,940	56,910,932	58,566,509	60,701,132	59,297,153	57,209,478	54,712,428
Sprint Local Telecommunications Divn.	7,508,495	7,639,277	7,735,076	7,445,851	7,104,118	6,576,970	4,406,859
total	146,113,255	158,066,173	164,002,826	167,695,090	163,450,309	156,522,587	147,761,736

Reasons For UNE Loop Price Decreases:

- Switched access lines increased by 11 percent from 1996 to 2000;
- The cost of capital decreased due to decreases in interest rates and stock market activity;
- Economies of scope related to significant increases in special access lines;
- Line increases without customers location increases will decrease cost.

Reasons For UNE Loop Price Increases:

- Switched access lines decreased by 11 percent from 2000 to 2002;
- Interest rates are at record lows for the post Vietnam Period. These interest rates will probably increase, increasing the cost of capital;
- Current Cost to Book Cost Ratios (CC/BC) are greater than one for most loop investments, implying that input inflation will increase loop costs;
- Agreement on the treatment of special access lines on loop structure costs will mitigate the impact of special access line growth on UNE costs.
 - This occurs because sharing between special and switched lines is now based on sheaths and fixed allocators rather than on voice equivalent line counts.
- Geo-coding of customer locations matches locations to lines.